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to be observed in the prominences; while the first, at 8498 Å, always shows bright borders, but is much the faintest of the three in the prominences.

Dr. P. W. Merrill called my attention to the fact that these three lines in the laboratory spectrum of calcium are strong in the spark, and therefore might be expected to show in prominences. Perhaps the converse is true, that the magnesium line at 8807 Å, which shows bright borders at the edge of the Sun, will be found to be a spark line.

Beyond 8807 Å no line was observed in the prominences and none was found to give certain indications of bright borders at the Sun's limb.

The intensity of the sky spectrum relative to that of the solar disk falls off quite rapidly with increasing wave-length. This phenomenon probably follows Rayleigh's law, according to which the scattering of light by the molecules of the Earth's atmosphere varies inversely as the fourth power of the wave-length. The low intensity of the scattered light in the deep red and infra-red should facilitate the observation of any strong coronal lines that might be present. However, no such lines were found. The solar image is noticeably steadier in the infra-red than it is in the yellow-green.

Mt. Hamilton, Calif.,

KEIVIN BURNS.

November 17, 1919.

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#### THE H $\alpha$ LINE IN *o Ceti*

During the recent maximum of *o Ceti*, which occurred early in August, its spectrum was photographed in the region 4800 to 6700 Å. The first spectrogram was obtained on July 22nd with the one-prism spectrograph set for minimum deviation and focus at D. On examining the plate it was seen that H $\alpha$  and H $\beta$  were both bright and that H $\alpha$  was strongly displaced toward the violet, while H $\beta$  was shifted toward the red with reference to the hydrogen comparison lines. Since the displacement of H $\beta$  was the same as that ordinarily shown by the hydrogen lines in *o Ceti*, it was considered that H $\alpha$  presented a peculiarity which should be investigated further. Accordingly plates were secured on July 25th and September 16th with the three-prism spectrograph set for minimum deviation at D. On both plates the H $\alpha$  line is well shown. A plate was also obtained on August 6th with the one-prism spectrograph set for H $\gamma$ . This plate shows the bright lines H $\beta$ , H $\gamma$ , H $\delta$ ,

$H\zeta$  and  $H\eta$ . The displacements of the hydrogen lines on these four plates have been measured and are given below. They are with reference to the absorption spectrum of the star for which a radial velocity of +62.1 km. has been used. The sign + indicates that the line is displaced toward the violet.

Date	Spectrograph	Displacement in Angstroms					$H\eta$
		$H\alpha$	$H\beta$	$H\gamma$	$H\delta$	$H\zeta$	
1919 July 22	I Prism D	+2.1	+0.1				
July 25	III Prism D	+1.32					
Aug. 6	I Prism $H\gamma$		+0.11	+0.20	+0.22	+0.08	+0.16
Sept. 16	III Prism D	+1.09					

The  $H\alpha$  displacements shown in the table might seem to indicate a progressive change but this is probably due to accidental errors of measurement. This is rendered more probable by the fact that a plate taken with the one-prism D spectrograph on November 3rd, when compared on the Hartmann measuring engine with the plate of July 22nd shows no change in the position of  $H\alpha$  between these two dates.

It might be suggested that in view of the occurrence of other emission lines than those of hydrogen in the spectrum of  $\text{o Ceti}$ , the line above referred to as  $H\alpha$  is really some other line and that  $H\alpha$  is very weak or absent. This is not very probable, however, because all the other hydrogen lines as far as  $H\delta$  have been observed during the recent maximum and it would be about as difficult to account for the absence of  $H\alpha$  as for its anomalous displacement. In addition, no other bright lines have been observed in the visual region, and it is quite unlikely that the only one should be of such great intensity and so near the normal position of  $H\alpha$  as the line here discussed.

A more complete discussion of both the visual and the ultra-violet spectrum of  $\text{o Ceti}$  will be published in the near future.

C. D. SHANE.